

**THE AMENDMENTS**

**In the Claims**

- 1-6. (Canceled)
7. (Currently Amended) A substrate with a surface comprising a microarray of DNA sequences, wherein (i) the microarray has a density of about 400 or more discrete regions of DNA sequences per  $\text{cm}^2$  of substrate surface, (ii) the DNA sequences are isolated polynucleotides, (iii) the microarray comprises 400 or more regions, and (iv) the DNA sequences contained in each discrete region are at least about 50 subunits in length, which are individually applied to each region in the microarray and are directly deposited on the surface of the substrate.
8. (Previously Presented) The substrate of claim 7, wherein the density of discrete regions of DNA sequences is at least about  $10,000/\text{cm}^2$ .
9. (Previously Presented) The substrate of claim 7, wherein the density of discrete regions of DNA sequences is at least about  $2500/\text{cm}^2$ .
10. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the substrate is glass.
11. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the substrate is non-porous.
12. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the surface of the substrate is hydrophobic.
13. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the surfaces of the substrate comprises one or more chemical moieties selected from the group consisting of silyl, hydroxyl, carboxyl, amine, aldehyde, and sulhydryl
14. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the DNA sequences are covalently bound to the surface of the substrate.

15. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the DNA sequences are non-covalently bound to the surface of the substrate.

16. (Previously Presented) The substrate of claim 15, wherein the DNA sequences are non-covalently bound to a polycationic polymer on the surface of the substrate.

17. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the DNA sequences are selected from the group of polynucleotides consisting of mRNA-derived sequences, genomic DNA sequences and fragments thereof.

18. (Previously Presented) The substrate of any one of claims 7, 8 or 9, wherein the microarray comprises 2,500 or more regions.

19. (Previously Presented) The substrate of any one of claims 7, 8, or 9, wherein the microarray comprises 10,000 or more regions.

20. (Canceled)

21. (Currently Amended) A substrate with a surface comprising a microarray of DNA sequences, wherein the DNA sequences are polynucleotides, produced by a method comprising the steps of

(a) depositing a selected volume between about 0.002 nl and about 2 nl of a solution comprising a selected, isolated polynucleotide at a discrete region on the surface of the substrate, wherein the DNA sequences are directly bound to the surface of the substrate, and

(b) repeating step (a) at other locations on the surface of the substrate until a microarray of 400 or more regions is formed, wherein the regions are at a density of at least about 400 regions/cm<sup>2</sup>.

22. (Previously Presented) The substrate of claim 21, wherein the density of discrete regions in the microarray is about 10,000 regions/cm<sup>2</sup> or more.

23. (Previously Presented) The substrate of claim 21, wherein the density of discrete regions in the microarray is about 2,500 regions/cm<sup>2</sup> or more.

24. (Previously Presented) The substrate of claim 21, wherein the substrate is glass.

25. (Previously Presented) The substrate of claim 21, wherein the substrate is non-porous.

26. (Previously Presented) The substrate of claim 21, wherein the surface of the substrate is hydrophobic.

27. (Previously Presented) The substrate of claim 21, wherein the surface of the substrate comprises one or more chemical moieties selected from the group consisting of silyl, hydroxyl, carboxyl, amine, aldehyde, and sulfhydryl.

28. (Canceled)

29. (Previously Presented) The substrate of claim 21, wherein the DNA sequences are covalently bound to the surface of the substrate.

30. (Previously Presented) The substrate of claim 21, wherein the DNA sequences are non-covalently bound to the surface of the substrate.

31. (Previously Presented) The substrate of claim 21, wherein the DNA sequences are selected from the group of polynucleotides consisting of mRNA-derived sequences, genomic DNA sequences, and fragments thereof.

32. (Previously Presented) The substrate of any one of claims 21, 22 or 23, wherein the microarray comprises 2,500 or more regions.

33. (Previously Presented) The substrate of any one of claims 21, 22, or 23, wherein the microarray comprises 10,000 or more regions.

34. (Currently Amended) A substrate with a surface comprising a microarray of DNA sequences and suitable for analysis of a polynucleotide mixture, wherein (i) the microarray has a density of about 400 or more discrete regions of DNA sequences per  $\text{cm}^2$  of substrate surface; (ii) each of said regions contains, as an isolated polynucleotide, a unique DNA sequence having at least about 50 subunits; (iii) the microarray comprises at least 400 regions ~~essentially free of cross-contamination by~~ having individually applied DNA sequences unique to others of said 400 regions, such that the DNA sequences in said regions are selective in hybridizing with corresponding members of said mixture.

35. (Currently Amended) A substrate according to claim 34, wherein the ~~freedom from cross-contamination in said 400 regions is sufficient to permit~~ microarray permits detection of a two-fold change in the relative abundance of polynucleotides in mixtures subjected to analysis.

36. (Previously Presented) A substrate with a surface comprising a microarray of DNA sequences wherein (i) the microarray has a density of 400 or more discrete regions of DNA sequences per  $\text{cm}^2$  of substrate surface, (ii) the DNA sequences are purified polynucleotides having at least 50 subunits, and (iii) the DNA sequences are non-covalently bound to a polycationic polymer on the surface of the substrate.

37. (Previously Presented) The substrate according to claim 36, wherein the DNA sequences are cDNAs.

38. (Previously Presented) A substrate with a surface comprising a microarray of DNA sequences of claim 7 or 36, wherein the DNA sequences are distinct gene sequences whose expression levels are specifically related to the differences between test cells relative to control cells.

39. (Previously Presented) A substrate with a surface comprising a micorarray of DNA sequences of claim 34, wherein the DNA sequences are distinct gene sequences whose expression levels are specifically related to the differences between test cells relative to control cells.

40. (Previously Presented) The substrate of claim 21, wherein the regions are at a density between about 62,500 regions/cm<sup>2</sup> and about 625 regions/cm<sup>2</sup>.